

REMARKS**A. Introduction**

Claims 1-6 are currently pending. Claims 7 and 8 and non-elected claims 9-20 have been cancelled without prejudice or disclaimer. Applicant reserves the right to file divisional applications directed to the subject matter claimed in now cancelled claims 7-20.

In the Office Action mailed August 14, 2002, claims 1-8 were rejected. Claim 8 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1 and 5 were rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent No. 6,341,071 to Johnson et al. (hereinafter, "the Johnson et al. reference"). Claims 2, 3, 4, 6 and 7 were rejected under 35 U.S.C. § 103(a) as being obvious over the Johnson et al. reference as applied to claims 1 and 5 and further in view of the Examiner's remarks. Applicant respectfully traverses each of these rejections.

B. Rejection of Claim 8 under 35 U.S.C. § 112, second paragraph

Claim 8 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicant respectfully submits that this rejection is rendered moot in view of the cancellation of claim 8.

C. Rejection of Claims 1 and 5 under 35 U.S.C. 102(b)

Claims 1 and 5 were rejected under 35 U.S.C. 102(b) as being anticipated by the Johnson et al. reference. Applicant respectfully traverses this rejection.

According to the rejection,

Johnson et al. teach a structure for providing interconnections in a wafer level package, comprising a conductive pad 44 that overlays an air space 43, wherein at least a portion of the air space extends laterally beyond the conductive pad. See figures 1-11 and col. 1, line 10 to col. 6, line 45.

With respect to claim 5, Johnson et al. further teaches that a major axis of the air space is radial to a center of the wafer level package. See figure 2.

Contrary to the above characterization of the Johnson et al. reference, the Johnson et al. reference actually teaches that the conductive pad 44 overlays the substrate material and not the air space:

An annular void 43 of height ΔH_1 within the substrate 42 surrounds *substrate material underneath the BGA pad 44*. An annular void 56 of height ΔH_2 within the board 52 surrounds board material underneath the circuit card pad 54.

The Johnson et al. reference, col. 4, lines 9-12, (emphasis added).

An annular void 76 of height ΔY within the board 72 surrounds *board material underneath the circuit card pad 74*. ... The annular void 76 provides space so that *the substrate material underneath the circuit card pad 74 is less constrained*, thereby increasing its compliance and alleviating the thermally induced strain in the solder ball 68.

The Johnson et al. reference, col. 4, lines 36-38 and lines 42-46, (emphasis added).

An annular void 83 of height ΔZ within the substrate 82 surrounds
substrate material underneath the BGA pad 84.

The Johnson et al. reference, col. 4, lines 36-38 and lines 60-62, (emphasis added).

Based upon the above express teachings of the Johnson et al. reference, it is clear that the Johnson et al. reference only teaches a substrate material or circuit board material as being underneath the conductive pad, and that the void of the Johnson et al. reference surrounds the substrate material or circuit board material and is located outside the periphery of the contact pad. In contrast, the conductive pad of the present invention as claimed in claim 1 overlays an air space with at least a portion of the air space extending laterally beyond the conductive pad. There is nothing in the Johnson et al. reference that teaches or suggests a conductive pad that overlays an air space. Accordingly, it is respectfully submitted that the rejection of claim 1 under 35 U.S.C. § 102(b) is hereby traversed.

Claim 5 was rejected on the basis that the Johnson et al. reference “teaches that a major axis of the air space is radial to a center of the wafer level package. See figure 2.” Claim 5 is dependent on claim 1 and includes all of the limitations of claim 1, and as such, applicants respectfully submit that claim 5 is allowable as being based on an allowable base claim.

D. Rejection of Claims 2, 3, 4, 6, and 7 under 35 U.S.C. 103(a)

Claims 2, 3, 4, 6, and 7 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Johnson reference as applied to claims 1 and 5 above, and further in view of the Examiner’s remarks. Claim 7 has been cancelled as being duplicative of claim 3; accordingly, the rejection

of claim 7 is hereby rendered moot. In regard to the rejection of claims 2-4 and 6, applicant respectfully traverses the rejection of these claims. Applicant submits that because claims 2-4 and 6 are dependent on claim 1, claims 2-4 and 6 are allowable as being based on an allowable base claim.

Conclusion

In view of the above amendments and arguments, applicant respectfully submits that claims 1-6 are in condition for allowance, and notice to that effect is respectfully requested.

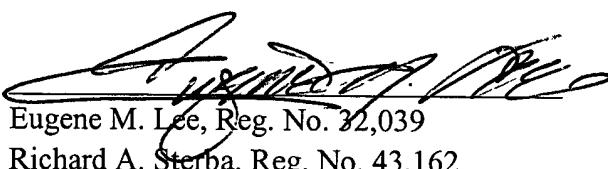
Finally, if the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing remarks, reconsideration of this application is respectfully requested, and an early and favorable action upon all the claims is hereby requested.

Respectfully submitted,

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**PETITION and
DEPOSIT ACCOUNT CHARGE AUTHORIZATION**

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying papers may also be charged to Deposit Account No. 50-1645.